

Integrated Intelligent System of Systems (IISoS)

Arctic Domain Awareness Center (ADAC)
A DHS Center of Excellence



ARCTIC DOMAIN
AWARENESS CENTER

A DEPARTMENT OF HOMELAND SECURITY CENTER OF EXCELLENCE

at  UNIVERSITY of ALASKA ANCHORAGE

GeoNorth, LLC

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June 29 & 30, 2015



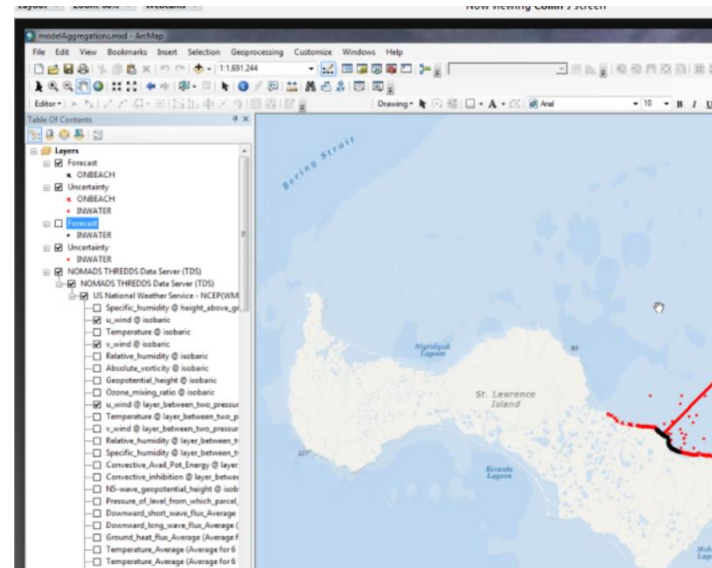
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Integrated Intelligent System of Systems (IISoS)

- ▶ Integration of data/feeds
- ▶ Near real time
- ▶ Client Interface
- ▶ Scenarios

Integrated Intelligent System of Systems (IISoS)

- ▶ General NOAA Operational Modeling Environment (GNOME)
 - HYCOM + NCODA
 - NCEP NAM (#2) and GFS (#1)
- ▶ CBONS
- ▶ AIS
- ▶ WaveWatch III





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Now viewing Colin's screen

gnome.orr.noaa.gov/goods/currents/HYCOM/subset

Apps | UAASTUFF | work | workerrday | tools | craigslist | coolStuff | wishlist | igoogole | gotomls | scratchpad | pyopenc | geostuff | galnex

GOODS

GNOME Online Oceanographic Data Server

OFFICE OF RESPONSE AND RESTORATION • NOAA'S NATIONAL OCEAN SERVICE

Source: HYCOM
Subregion:

Select a subdomain by entering latitude/longitude values below or use the rectangle selector tool on the map.

Start time 2015-06-14 00:00:00 **Time step** 1 **End time** 2015-06-23 00:00:00

North Latitude 90.0

West Longitude -180.0 **Dateline** ☐ **East Longitude** 180.0

South Latitude -78.6

Grid spacing (x/y) 1 **3-d output** ☐

Dataset dimensions:

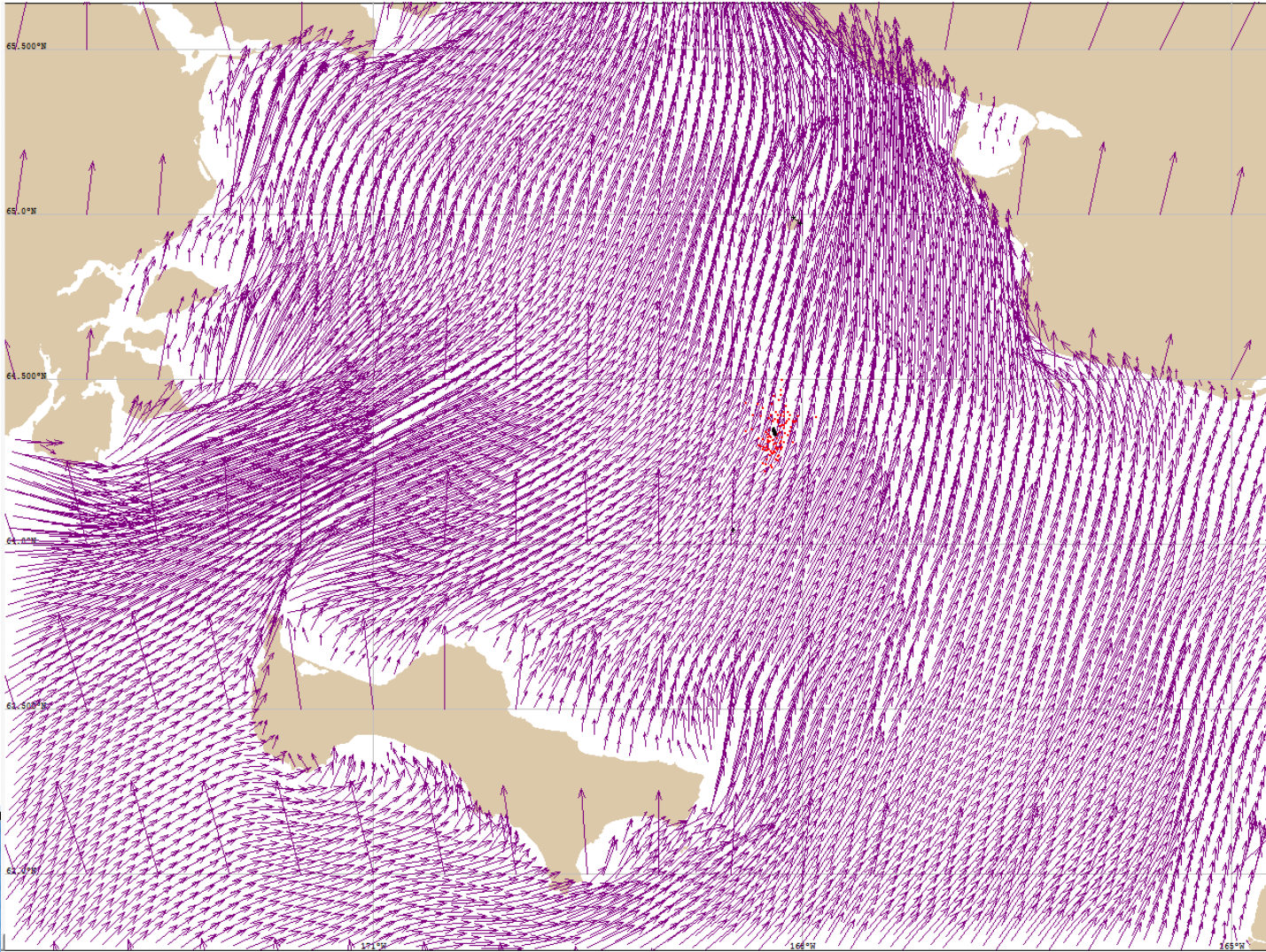
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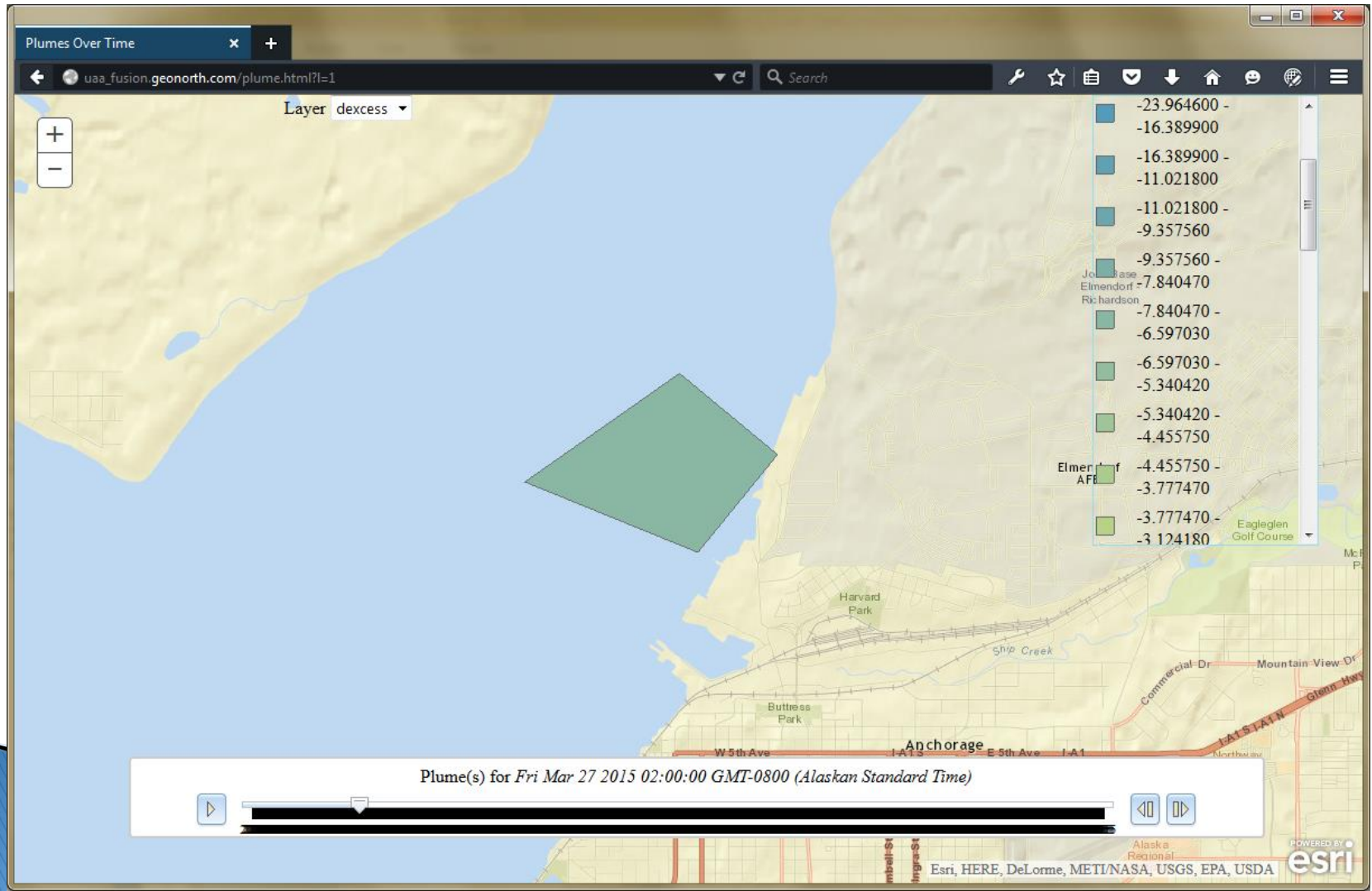
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GNOME using HYCOM & GFS Data as inputs for the ship drift simulation





Web based animated isotope footprint from port sensor for detecting sea ice

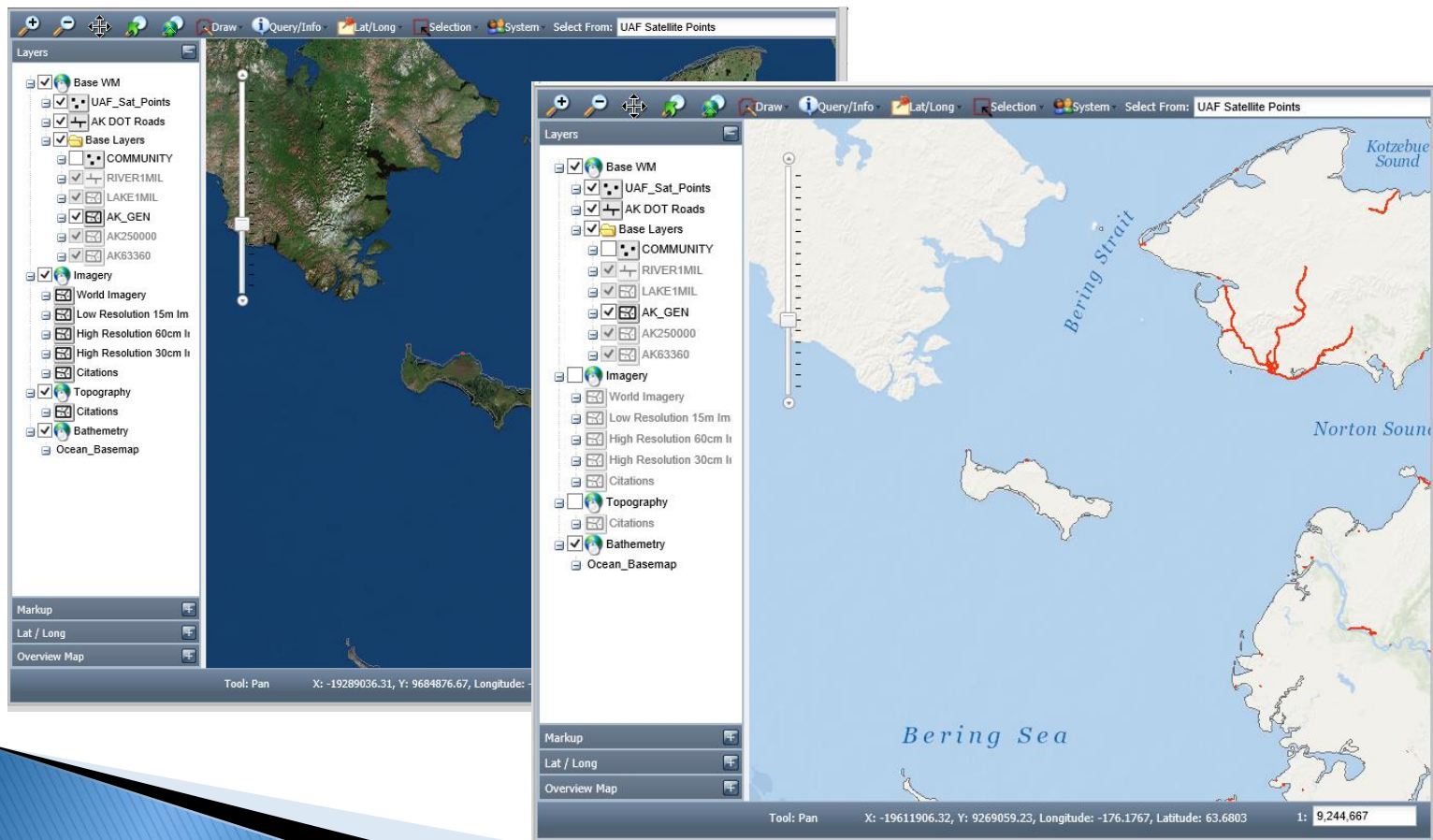




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Web Application consuming Web Map Services (WMS)

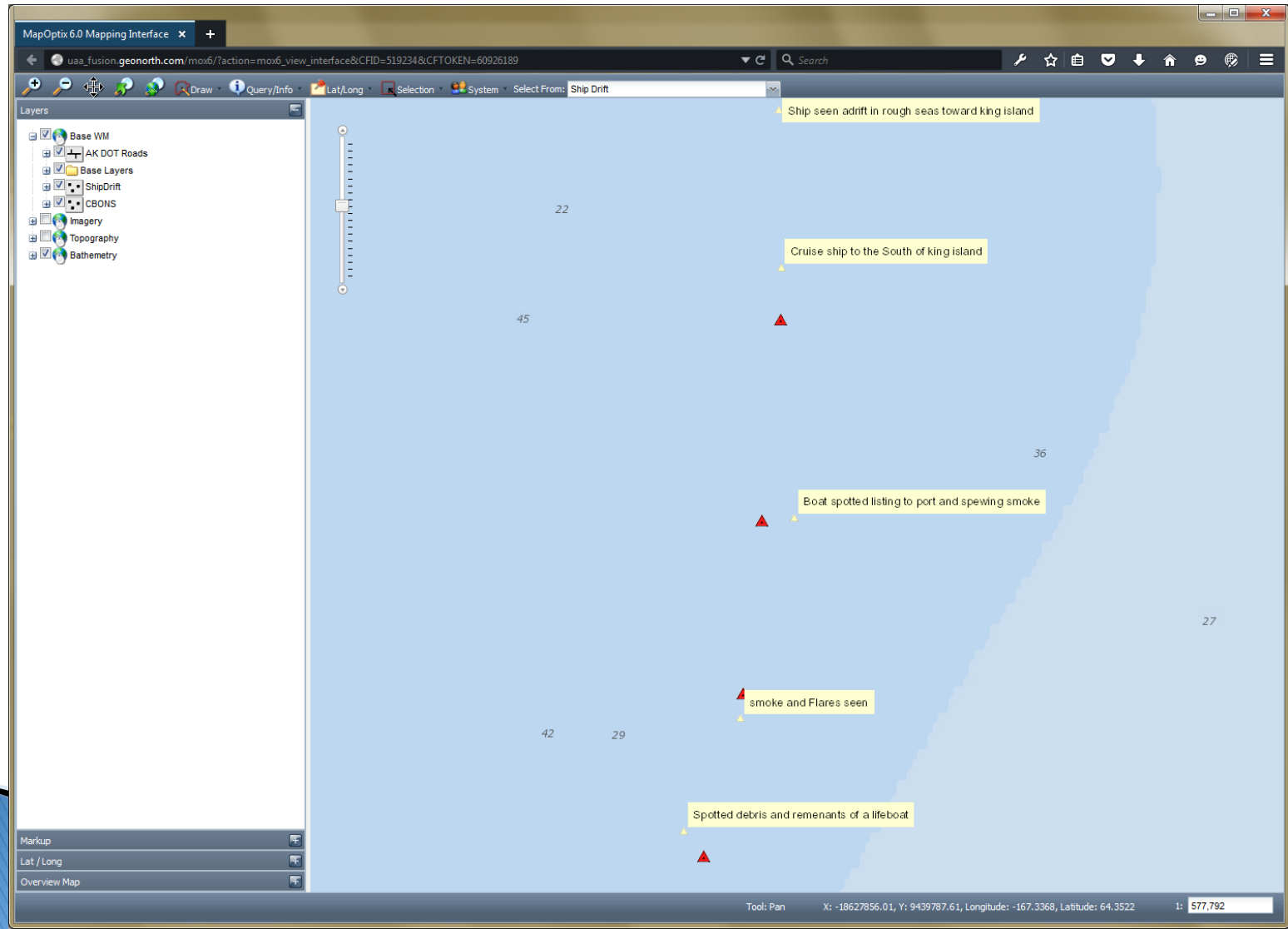




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Ship Drift and CBON data displayed via MapOptix on the web





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- ▶ Crystal Serenity SAR Scenario
 - Bering Strait/St. Lawrence Island
 - Nearby ship fails at a known time/location
 - Provide prediction of ship location over time
 - GNOME model output consumed by GeoNorth client interface
 - Forecast of environmental conditions
 - Stricken ship trajectory history and forecast



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IISoS: ADAC R&D Demo

Goal: ADAC researchers working to test and demo the current state of the system in a scenario demo:

The scenario: A ship is fails nearby Lawrence Island – at known time and location. Goal: provide prediction the ship for an extended time. Use observer feedback.

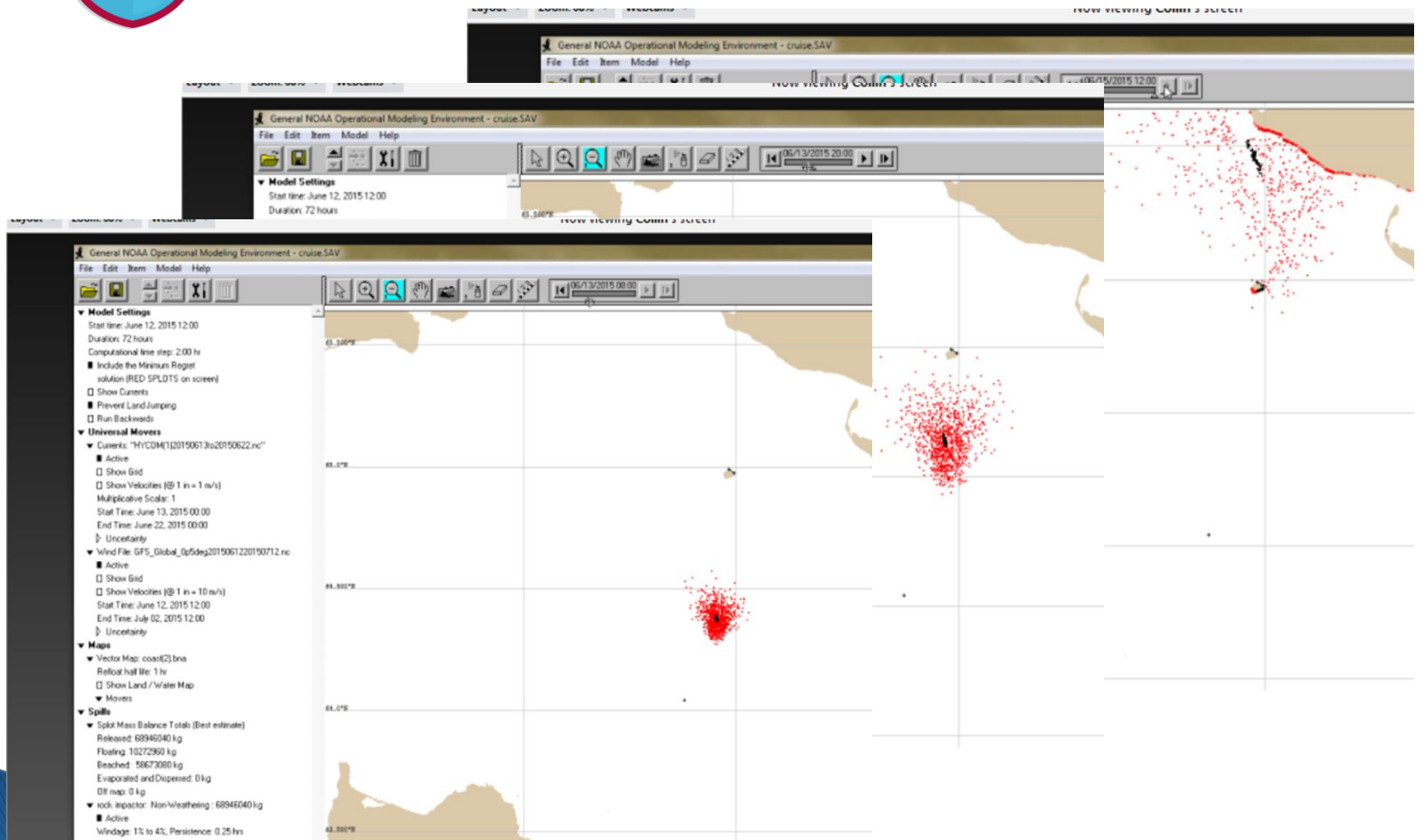
Requirements:

1. Platform to run GNOME on the GeoNorth platform to make drift predictions
2. System to pull data streams to run GNOME: sea currents, sea ice, wind
 - a. Locate an fetch/pre-fetch the data
 - b. Storage
3. System to pull and store real-time observations to restart gnome
 - a. Multiple instance of gnome running concurrently if conflicting observations
4. Display Geo spatial layers to display
 - a. The stricken ship trajectory history and forecast
 - b. Forecast environmental conditions
 - c. Resources including local observers



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**Ship Drift Simulation displayed along with CBON data and AIS ship tracking in
ARCGIS via WMS**





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Scenario Demonstration